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(54) **METHOD FOR PRODUCING F<sub>2</sub>-CONTAINING GAS, APPARATUS FOR PRODUCING F<sub>2</sub>-CONTAINING GAS, METHOD FOR MODIFYING ARTICLE SURFACE, AND APPARATUS FOR MODIFYING ARTICLE SURFACE**

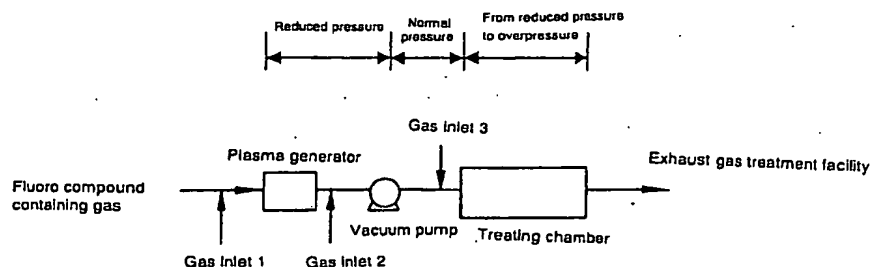
(57) The present invention provides processes and equipments for safely and easily preparing an F<sub>2</sub>-containing gas, as well as processes and equipments for surface modification using the F<sub>2</sub>-containing gas prepared.

According to the present invention, a gas containing a fluoro compound that is easier to handle than F<sub>2</sub> is supplied and the fluoro compound is excited and decomposed to convert it into F<sub>2</sub> gas before surface modification and then used for surface modification. According to the present invention, there is no necessity of providing, stor-

ing and transporting a large amount of F<sub>2</sub> gas in advance because a necessary amount of F<sub>2</sub> gas is obtained immediately before surface modification.

A process for preparing an F<sub>2</sub>-containing gas comprises the steps of exciting at least one fluoro compound in a fluoro compound-containing gas by conferring energy on the fluoro compound-containing gas under reduced pressure; and partially or completely converting the excited fluoro compound-containing gas containing the excited fluoro compound into F<sub>2</sub> under normal pressure or overpressure.

Figure 1





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Date

15-11-2006

Reference  
069EP 1009 SE

Application No./Patent No.  
05727964.8 - 2111 PCT/JP2005006149

Applicant/Proprietor  
Kanto Denka Kogyo CO., LTD.

#### Communication pursuant to Rules 109 and 110 EPC

##### (1) Amendment of application documents, especially the claims (R. 109 EPC)

The above mentioned international (Euro-PCT) application has entered the European phase, or can do so, once the necessary conditions are fulfilled.

Under Articles 28, 41 PCT, Rules 52, 78 PCT and Rule 86(2) to (4) EPC, the applicant may amend the application documents after receiving the international search report.

**Whether or not he has already done so, he now has a further opportunity to file amended claims or other application documents within a non-extendable time limit of one month after notification of the present communication (R. 109 EPC).**

The claims applicable on expiry of the above time limit, i.e. those filed on entry into the European phase or in response to the present communication, will form the basis for the calculation of any claims fee to be paid (see page 2) and for any supplementary search to be carried out under Article 157(2) EPC (R. 109 EPC).

--2/

**(2) Claims fees under Rule 110 EPC**

If the application documents on which the European grant procedure is to be based comprise more than ten claims, a claims fee shall be payable for the eleventh and each subsequent claim within the period provided for in Rule 107(1) EPC.

- ☒ Based on the application documents currently on file, all necessary claims fees have already been paid (or the documents do not comprise more than 10 claims).
- ☐ All necessary fees will be/have been debited automatically according to the automatic debit order.
- ☐ The claims fee due for the claims ..... to ..... were not paid within the above-mentioned period.

Any non-paid claims fee, either based on the current set of claims or on any amended claims to be filed pursuant to Rule 109 EPC (see page 1), may still be validly paid within a non-extendable period of grace of **one month** after notification of this communication.

If a payment is made for only some of the claims, it must be indicated for which claims it is intended. If a claims fee is not paid in due time, the claim concerned is deemed to be abandoned (R. 110(4) EPC).

If claims fees have already been paid, but on expiry of the above-mentioned time limit there is a new set of claims containing fewer fee-incurring claims than previously, the claims fees in excess of those due under Rule 110(2), 2nd sentence, EPC will be refunded (R. 110(3) EPC).

You are reminded that any supplementary search under Article 157(2) EPC will relate only to the last set of claims applicable on expiry of the above time limit AND will be confined to those fee-incurring claims for which fees have been paid in due time.

**The fee for the eleventh and each subsequent claim is EUR 45,00.**

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Date

15.11.06

Reference 069EP 1009 SE	Application No./Patent No. 05727964.8 - 2111 PCT/JP2005006149
Applicant/Proprietor Kanto Denka Kogyo CO., LTD.	

**Notification of European publication number and information on the application of Article 67(3) EPC**

You are hereby informed that the technical preparations for the publication of the translation of the above-mentioned international application as supplied to the EPO pursuant to Article 158(2) EPC have been completed.

The translation will be published on 13.12.06.

The publication number is: 1731480.

The publication in accordance with Article 158(3) EPC will be mentioned in European Patent Bulletin number 2006/50. ([http://www.european-patent-office.org/e\\_pub/bulletin/index.htm](http://www.european-patent-office.org/e_pub/bulletin/index.htm)).

The title of the invention in the three official languages of the European Patent Office is worded as follows:

VERFAHREN ZUR HERSTELLUNG VON F<sb>2</sb>-HALTIGEM GAS, VORRICHTUNG ZUR  
PRODUKTION VON F<sb>2</sb>-HALTIGEM GAS, VERFAHREN ZUM MODIFIZIEREN EINER  
GEGENSTANDSOBERFLÄCHE UND VORRICHTUNG ZUM MODIFIZIEREN EINER  
GEGENSTANDSOBERFLÄCHE  
METHOD FOR PRODUCING F<sb>2</sb>-CONTAINING GAS, APPARATUS FOR PRODUCING  
F<sb>2</sb>-CONTAINING GAS, METHOD FOR MODIFYING ARTICLE SURFACE, AND  
APPARATUS FOR MODIFYING ARTICLE SURFACE  
MÉTHODE DE PRODUCTION DE GAZ CONTENANT DU F<sb>2</sb>, APPAREIL DE  
PRODUCTION DE GAZ CONTENANT DU F<sb>2</sb>, MÉTHODE DE MODIFICATION DE LA  
SURFACE DE L'ARTICLE ET APPAREIL PERMETTANT DE MODIFIER LA SURFACE DE  
L'ARTICLE

The provisional protection under Article 67(1) and (2) EPC in the individual contracting states becomes effective only when the conditions referred to in Article 67(3) EPC have been fulfilled. For further information, also with respect to extension states, please refer to the EPO brochure "National Law relating to the EPC" (<http://www.european-patent-office/legal/national/index.htm>).

In all future communications to the EPO, please quote the application number as indicated above, i.e. including the final four figures (which identify the Directorate responsible for the subsequent procedure).

**REMARK:**

For European patent applications with a date of publication after 01.04.05, no paper copies will be forwarded to the applicant any longer. The publication can be downloaded, free of charge, from the EPO publication server <https://publications.european-patent-office.org> or can be ordered from the Vienna sub-office upon payment of a fee (see Decision of the President of the EPO dated 22 December 2004, OJ 2005, 124 and Notice from the EPO dated 22 December 2004 concerning the introduction of electronic publication of European patent applications (A-documents) and European patent specifications (B-documents) as well as changes to Rules 51(4), 54 and 108 EPC, OJ EPO 2005, 126).

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